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## ABSTRACT

Based on a survey of the characteristics of unemployed aerospace workers, this is the first of two reports developed to suggest alternate job opportunities in government agencies for unemployed aerospace engineers and scientists. Included in the brief summaries of 70 government job titles are general, basic qualifications and the government agency where the jobs are located. The information in the job summaries was taken from county, state, and Federal Government personnel and civil service documents, recruiting literature, examination announcements, and job specifications. A report containing summaries of job opportunities in private industry is available as VT 019 964 in this issue. (SB)

## ACKNOWLEDGEMENTS

The information contained in this report was gathered and organized by A.M. Leslie Draper, occupational analyst, of the California Occupational Analysis Field Center.

The initial phase of the study was concerned with determining the characteristics of the group of former aerospace workers now unemployed, something of the kind of jobs they held, their background, and the qualifications required for this kind of employment. Much help was given by a number of individuals and organizations, important among them Bill Curra of TRW, Norman C. Hill of the American Institute of Aeronautics and Astronautics, and George Wandrocke of the Pacific Southwest Universities Association, who along with many Experience Unlimited participants deserve our heartfelt thanks for providing information, criticism, and encouragement.

The second phase of the study, gathering data on alternate jobs for which members of the unemployed aerospace group might qualify, depended upon assistance and information from staff members of the Los Angeles County Civil Service Commission, the State Personnel Board in Los Angeles, and the U.S. Civil Service Commission representatives in Los Angeles.

## INTRODUCTION

This report has been developed to suggest alternate jobs for unemployed aerospace engineers and scientists. It consists of brief summaries of various jobs along with general or basic qualifications for employment in them. All jobs included are found in government agencies, primarily because these jobs and qualifications are quite rigidly standardized and lend themselves well to this use. It is believed these jobs may suggest many others in private industry for which hiring qualifications may be similar.

In the interest of brevity, complete job descriptions are not presented. They are available at the personnel departments of the employing government agencies. Qualifications or requirements for employment have also been summarized for brevity, and because the detailed academic and experience requirements outlined in the agency statements are likely to require agency judgment or evaluation for acceptance. It should be noted that in many cases, professional level experience of certain kinds, or other factors, may be evaluated by the hiring agency as equivalent to a degree and may satisfy the employment qualification. For complete information, it will require contact with the government agency concerned.

Although the job summaries at the county government level in this report are limited to Los Angeles County, they may serve as examples of similar jobs in other counties in the state.

## The Unemployed Aerospace Worker

A sample consisting of more than 200 applications to a training program for unemployed aerospace professionals, and 28 applications from the Los Angeles Department of Human Resources Development files was used to survey applicant characteristics. From this it was determined that approximately 68 percent of the group are between the ages of 45 and 62, with 55 percent between 45 and 55. Approximately 80 percent of the group have bachelor's degrees in engineering and science and about 20 percent have graduate degrees. Most of the degrees (73 percent) are in some engineering specialty with 29 percent in Mechanical Engineering, 21 percent in Electrical Engineering, 8 percent in Aeronautical Engineering and smaller percentages in structural, chemical, general, civil, metallurgical, marine, and industrial engineering. Chemistry degrees totalled 8 percent with some B.A. as well as B.S. degrees. Physics majors constitute approximately 10 percent of the group with mathematics around 2 percent.

Discussion with personnel managers and others concerned with aerospace employment confirmed that these figures do not vary widely from those developed from other sources.

## Source of Job Information

The information contained in this report is directed primarily to the worker with the kind of education and experience found to be typical of the aerospace group. A number of titles were selected which describe the degree major or field of job specialization related to aerospace work. Business Administration was also included because many resumes indicated

a number of people had considerable graduate course work in business administration, and because it served as an alternate qualification route to some jobs.

The information contained in the job summaries was taken direct from state, county, and federal government personnel and civil service documents, recruiting literature, examination announcements, and job specifications. No attempt was made to re-write the material beyond shortening it for use in summary form. Much of the actual information on job tasks and qualifications is copied verbatim from these sources, the major change being in presenting the data in an order which relates easily to field of study and work usual to the aerospace group.

#### "Series" Jobs and Individual Jobs

Many jobs in government are part of a "series". In other words the jobs included in a given series range from low to high in responsibility, complexity and pay. They may also bear similar titles and workers may promote from one job to another. Some government agencies permit entry to a series only at certain entry level jobs, while others evaluate the background of the applicant, and may permit entry to a series well above the lowest level. The U.S. Government jobs included are all shown as series' relating to a given discipline. Entry to these series' may be made at other than the lowest level. Most other jobs included are entry level jobs, although it is recognized that in the aerospace group for which this report is intended, most candidates will be better qualified than is required by the entry level jobs.

### The Employment Process

The actual employment process varies from one governmental agency to another. In some agencies written examinations and oral interviews are a major part of the hiring procedure. In others, qualification is based on college degrees earned by the applicant. Some agencies establish eligible hiring "lists" which may exist for one or two years, so that an unemployed worker might complete examinations successfully and retain a list position for some time.

## CONTENTS

Job titles here are grouped under the headings of various major fields of work or study common to engineers and scientists who have been employed in the aerospace industry. The user should review the headings listed, identify those most closely related to the background of an individual, then turn to the summaries of the government job titles listed under the headings for review. Job titles are found under more than one heading if a number of fields of work or study serve as minimum or basic qualification for entry into that occupation.

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Aeronautical or Aerospace Engineering	Air Pollution Analyst	3
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Applied Science Programmer I	10
	Assistant Control System Engineer	13
	Assistant Industrial Hygienist	18
	Assistant Utilities Engineer	21
	Building Engineering Inspector	25
	Deputy State Fire Marshal I	31
	Industrial Hygiene Series	41
	Oceanography Series	56
	Safety Engineer (Industrial)	62
	Weights and Measures Technician I	70

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Business Administration		
	Junior Planning Assistant	40
	Program Supervisor, Quantity Control	00
	Sampling Standards Analyst	64
Ceramic Engineering		
	Air Pollution Analyst	3
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Applied Science Programmer I	10
	Assistant Control System Engineer	13
	Assistant Industrial Hygienist	18
	Building Engineering Inspector	25
	Ceramic Engineering Series	26
	Deputy State Fire Marshal I	31
	Industrial Hygiene Series	41
	Safety Engineer (Industrial )	62
	Weights and Measures Technician I	70
Chemical Engineering		
	Air Pollution Analyst	3
	Air Pollution Engineer	5
	Air Pollution Engineering Assistant	6
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Applied Science Programmer I	10



<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Chemical Engineering (Contd.)	Associate Chemical Engineer	22
	Associate Motor Vehicle Pollution Control Engineer	24
	Building Engineering Inspector	25
	Chemical Engineering Series	27
	Deputy State Fire Marshal I	31
	Industrial Hygiene Series	41
	Industrial Waste Chemist	42
	Junior Chemical Testing Engineer	43
	Oceanography Series	56
	Safety Engineer (Industrial)	62
	Weights and Measures Technician I	70
Chemistry	Air Pollution Analyst	3
	Air Pollution Chemist	4
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Analytical Chemist	9
	Assistant Air Pollution Chemist	11
	Assistant Industrial Hygienist	18
	Building Engineering Inspector	25
	Chemistry Series	28
	Criminalist I	29
	Deputy State Fire Marshal I	31

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Chemistry (Contd.)	Food and Drug Inspection Series	36
	Food and Drug Inspection Trainee	37
	Industrial Hygiene Chemist	40
	Industrial Hygiene Series	41
	Junior Chemical Testing Engineer	43
	Junior Chemist	44
	Oceanography Series	56
	Sanitarian Series	65
	Toxicologist	69
	Weights and Measures Technician I	70
Electrical Engineering		
	Air Pollution Analyst	3
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Applied Science Programmer I	10
	Assistant Communications Engineer	12
	Assistant Control System Engineer	13
	Assistant Electrical Engineer	15
	Assistant Industrial Hygienist	18
	Assistant Utilities Engineer	21
	Associate Electronics Engineer	23
	Building Engineering Inspector	25
	Data Communications Engineer	30
	Deputy State Fire Marshal I	31

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Electrical Engineering (Contd.)	Electrical Engineering Assistant	32
	Electrical Engineering Series	33
	Electronics Engineer I	34
	Industrial Hygiene Series	41
	Oceanography Series	56
	Principal Electronics Engineering Assistant	59
	Radiology Equipment Specialist	61
	Safety Engineer (Industrial )	62
	Weights and Measures Technician I	70
Electronic Data Processing		
	Accounting Systems Analyst	1
	Assistant Data Processing Analyst	14
	Engineering Programmer-Analyst	35
	Software Analyst	66
Electronic Engineering		
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Applied Science Programmer I	10
	Assistant Control System Engineer	13
	Assistant Industrial Hygienist	18
	Associate Electronics Engineer	23
	Building Engineering Inspector	25
	Deputy State Fire Marshal I	31

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Electronic Engineering (Contd.)	Electronics Engineer I	34
	Medical Electronics Technician	50
	Principal Electronics Engineering Assistant	59
	Safety Engineer (Industrial)	62
	Weights and Measures Technician I	70
Engineering Science		
	Air Pollution Technician	8
	Applied Science Programmer I	10
	Assistant Control System Engineer	13
	Assistant Industrial Hygienist	18
	Building Engineering Inspector	25
	Deputy State Fire Marshal I	31
	Hydrology Series	38
	Oceanography Series	56
Industrial Engineering		
	Air Pollution Engineering Inspector I	7
	Assistant Industrial Hygienist	18
	Building Engineering Inspector	25
	Industrial Engineering Series	39
	Program Supervisor, Quantity Control	60
	Safety Engineer (Industrial)	62
	Sampling Standards Analyst	64

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Mathematics	Actuary Series	2
	Applied Science Programmer I	2
	Building Engineering Inspector	25
	Hydrology Series	38
	Mathematics Series	47
	Meteorologist I	53
	Oceanography Series	56
	Operations Research Series	57
	Program Supervisor, Quantity Control	60
	Sampling Standards Analyst	64
	Statistical Methods Analyst I	67
	Statistician Series	68
Mechanical Engineering	Air Pollution Analyst	3
	Air Pollution Engineer	5
	Air Pollution Engineering Assistant	6
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Applied Science Programmer I	10
	Assistant Control System Engineer	13
	Assistant Engineering Specialist (Mechanical)	16
	Assistant Engineering Specialist (Utilities)	17

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Mechanical Engineering (Contd.)	Assistant Industrial Hygienist	18
	Assistant Mechanical Engineer	19
	Assistant Transportation Engineer	20
	Assistant Utilities Engineer	21
	Associate Chemical Engineer	22
	Associate Motor Vehicle Pollution Control Engineer	24
	Building Engineering Inspector	25
	Deputy State Fire Marshal I	31
	Hydrology Series	38
	Industrial Hygiene Series	41
	Junior Mechanical Engineer	45
	Mechanical Engineering Assistant	48
	Mechanical Engineering Series	49
	Oceanography Series	56
	Safety Engineer (Industrial)	62
	Safety Engineering Series	63
	Weights and Measures Technician I	70
Metallurgy		
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Building Engineering Inspector	25
	Deputy State Fire Marshal I	31
	Metallurgy Series	51

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Meteorology		
	Meteorologist	52
	Meteorologist	53
	Meteorology Series	54
	Oceanography Series	56
Nuclear Engineering		
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Applied Science Programmer I	10
	Assistant Control System Engineer	13
	Assistant Industrial Hygienist	18
	Building Engineering Inspector	25
	Deputy State Fire Marshal I	31
	Nuclear Engineering Series	55
	Safety Engineer (Industrial)	62
Physics		
	Air Pollution Analyst	3
	Air Pollution Chemist	4
	Air Pollution Engineering Inspector I	7
	Air Pollution Technician	8
	Applied Science Programmer I	10
	Assistant Air Pollution Chemist	11
	Assistant Communications Engineer	12

<u>Degree Major or Field of Job Specialization</u>	<u>Related Government Job Title</u>	<u>Page</u>
Physics (Contd.)	Assistant Industrial Hygienist	18
	Associate Electronics Engineer	23
	Buildg Engineering Inspector	25
	Deputy State Fire Marsnal I	31
	Industrial Hygiene Series	41
	Oceanography Series	56
	Physics Series	58
	Radiology Equipment Specialist	61
	Weights and Measures Technician I	70
Statistics		
	Applied Science Programmer I	10
	Operations Research Series	57
	Statistical Methods Analyst I	67
	Statistician Series	68
Systems Engineering		
	Accounting Svstems Analyst	1
	Assistant Data Processing Analyst	14
	Engineering Programmer-Analyst	35
	Software Analyst	66
Index of Job Summaries		71



Performs professional accounting systems analysis work in connection with the development, evaluation, and review of large-scale and complex computerized and non-automated fiscal control systems.

Conducts studies and makes evaluations of existing departmental accounting operations, fiscal controls, accounting standards and forms, in both computerized and non-automated accounting systems.

Qualifications: Bachelor's degree with twenty-one semester units of accounting including a course in auditing and one year's professional auditing or accounting experience at the level of Intermediate Accountant-Auditor or Accountant III or one year's EDP systems analysis or programming experience at the level of EDP Assistant Programmer Analyst.

This series includes positions which involve the application of professional knowledge and experience in actuarial science (including mathematics, statistics, business, financial, and economic principles) to programs or problems related to annuities, and to life, health, or property risks and contingencies.

Qualification: Bachelor's degree which must have included courses in mathematics totaling at least 24 semester hours and must have included differential and integral calculus and in addition, one or more courses in mathematics for which these courses are prerequisite. Six semester hours in statistical theory and method may be substituted for six semester hours of the mathematics requirement.

## AIR POLLUTION ANALYST

County of Los Angeles

Participates in the analysis of technical data pertaining to air pollution control, including emissions measurements from both mobile and stationary sources, atmospheric monitoring, meteorological conditions, air quality standards and research projects, by preparing technical reports, graphs, charts and statistical models.

Qualification: Bachelor's degree in engineering or the physical sciences and two years' experience analyzing, evaluating, and making recommendations on research activities in any of the above fields of college specialization. Must have Class "3" driver's license.

## AIR POLLUTION CHEMIST

County of Los Angeles

Determines appropriate chemical or physical tests to be applied and using analytical techniques and instrumentation, tests and analyzes the composition of compound substances in solid, liquid and gaseous form. Researches technical journals, textbooks, chemical manuals and other source materials to determine the best methods of performing analytical tests on a wide variety of substances..

Qualification: Bachelor's degree in chemistry or physics with course work in quantitative and qualitative analysis, organic chemistry, and chemical instrumentation, and two years' chemistry experience in an air pollution laboratory or other chemical research experience dealing with the quantitative and qualitative identification of a wide variety of complex organic and inorganic compounds. An MS degree can be substituted for one year of the required experience.

AIR POLLUTION ENGINEER

County of Los Angeles

Under the general supervision of a registered chemical or mechanical engineer, performs complex air pollution source testing work related to emission sampling; conducts air pollution emission surveys and studies, reviews permit applications, and performs related staff duties.

Qualification: Bachelor's degree in chemical or mechanical engineering or one year's experience as a Senior Air Pollution Engineering Assistant for L.A. County.

AIR POLLUTION ENGINEERING ASSISTANT

County of Los Angeles

Assists in the performance of air pollution source testing work related to emission sampling, recording and calculating data, and reporting test results. Performs chemical engineering calculations in determining particulate matter concentration and emission rates from stack gas flow, laboratory sample weight, and condensate data.

Qualification: Bachelor's degree in chemical or mechanical engineering. Must have a California Class "3" driver's license.

AIR POLLUTION ENGINEERING INSPECTOR I

County of Los Angeles

Conducts field inspections and investigations of equipment, devices, and systems in industrial or commercial operations which are potential air pollution sources. Inspects air pollution control equipment and investigates processing methods in industrial or commercial establishments and reports on compliance with air pollution control laws, rules, and regulations. Appears as an expert witness in court and before the Hearing Board regarding air pollution violations.

Qualification: Bachelor's degree which includes at least 24 semester units in engineering, chemistry or physics. One year of experience in engineering, physics, chemical, or metallurgical work involving industrial processes may be substituted for each year of college to a maximum of two years.

AIR POLLUTION TECHNICIAN

County of Los Angeles

Operates and services or installs, calibrates, maintains and repairs and makes minor modifications to instruments and equipment used in air monitoring or air pollution research and testing programs.

Qualification: Three years' experience operating and maintaining or repairing instruments used for industrial purposes or engineering or scientific investigations. Acceptable Substitution: Completion of 60 semester units of a curriculum in engineering, physical science, or electronics in an accredited college or recognized trade school which includes at least 24 semester units of chemistry, electronics, or electrical courses for two years of the required experience.



# ANALYTICAL CHEMIST

County of Los Angeles

Determine composition of compound substances by chemical analyses. Uses instrumentation or "wet" chemical methods to perform chemical analyses. Makes chemical analyses of biological specimens such as glucose, insulin, and enzyme assays. Calibrates instruments used in chemical analyses. Assists in the investigation of special analytical problems.

Qualification: Bachelor's degree in chemistry.

## APPLIED SCIENCE PROGRAMMER I

State of California

Applied Science Programmer I's translate problem statements and detailed flow charts into series of code and detail operating instructions; assist in preparing flow charts on complex problems; program simple problems and clearly defined segments of large complex programs; assist on tests of coded programs and revisions to eliminate errors and excess machine time; may operate computer and peripheral equipment; and may analyze machine stoppage and initiate or recommend needed changes.

Applied Science Programmers are employed by the Division of Highways and the Departments of Public Health and Water Resources.

Qualification: Bachelor's degree with major work in an applied science such as mathematics, engineering, physics, or statistics.

ASSISTANT AIR POLLUTION CHEMIST

County of Los Angeles

Analyzes the composition of compound substances using analytical chemical techniques and assists with the adaptation and development of required instruments. Applies a knowledge of college level quantitative and qualitative chemical methods in performing chemical analysis of samples taken in connection with air monitoring, industrial source testing, automotive exhaust research, and other air pollution problems.

Qualification: Bachelor's degree in chemistry or in physics with course work in quantitative and qualitative analysis, organic chemistry, analytic chemistry, and chemical instrumentation.

ASSISTANT COMMUNICATIONS ENGINEER

State of California

Assists in conducting engineering surveys of communication systems; makes assigned laboratory tests of communications equipment; prepares reports on assigned portions of projects; assists in the preparation of communications equipment specifications and operational procedures for communications systems; prepares inventories of communication supplies and equipment; makes special studies as required; advises and instructs operating and maintenance personnel of state agencies on radio and land wire communication systems.

Qualification: One year as Junior Electrical Engineer in California state service in the communications field, or a master's degree with specialization in communications, and a degree in electrical engineering or physics.

ASSISTANT CONTROL SYSTEM ENGINEER

State of California

Assists in conducting technical engineering studies related to the development of an automatic, computerized, control system; assists in the design and preparation of plans and technical specifications of the less complex features of a control system; conducts engineering tests of control system equipment to determine conformance with operational standards, design, and plans and specifications; assist in the preparation of testing, operation, and maintenance procedures, manuals, and training programs; advises, assists, and instructs operating and maintenance personnel in matters pertaining to automatic control systems.

Qualification: Two years experience in the field of control or process systems, and a degree in engineering.

ASSISTANT DATA PROCESSING ANALYST

County of Los Angeles

Evaluates the less difficult departmental data processing budgets and requests, conducts the less difficult feasibility studies, prepares reports, recommendations, and equipment specifications, and works with departments in the installation of electronic data processing procedures and equipment.

Qualification: Two years' electronic data processing experience in either (1) a responsible staff capacity in the analysis of systems and procedures or (2) the analysis of accounting systems, or (3) computer programmings.

ASSISTANT ELECTRICAL ENGINEER

State of California

Prepares designs, detailed plans, and specifications for electric power plants and substations, power and lighting distributing systems, motor installations, telephone, radio, motion picture, x-ray, and other electrical systems; prepares material lists for electrical layouts; prepares requisitions for the purchase of electrical materials; inspects electrical installations; checks electrical shop plans and details; prepares reports.

Qualification: One year as Junior Electrical Engineer in California state service and degree in electrical engineering or two years experience, one of which must be at least at the level of junior electrical engineer. Or a master's degree may be substituted for experience.

ASSISTANT ENGINEERING SPECIALIST (Mechanical)

State of California

Performs a wide variety of field or office engineering work of average difficulty relating to mechanical engineering projects of various types; assists in the preparation of plans and specifications; does detailed drafting and prepares estimates; makes engineering inspections for compliance with plans and specifications; makes engineering investigations, assembles data, and prepares engineering reports, appraisals, or valuations; may supervise subordinate engineers or engineering aids in any of the above; dictates correspondence.

Qualification: Master's degree in mechanical engineering



ASSISTANT ENGINEERING SPECIALIST (Utilities)

State of California

Performs a wide variety of field or office engineering work of average difficulty, relating to valuations, appraisals, and rates in connection with various types of public utilities; assists in the review of plans and specifications; does detailed drafting and prepares charts and graphs; makes engineering inspections; assembles data and prepares engineering reports, appraisals, or valuations; may supervise subordinate engineers or engineering aids in any of the above, and dictates correspondence.

Qualification: Two years varied professional engineering experience (following graduation from college) comparable in level to that performed by a Junior Engineer in the California state service. Master's degree will substitute for experience. Basic requirement is for degree in engineering.

ASSISTANT INDUSTRIAL HYGIENIST

County of Los Angeles

Assists in and learns to perform technical field and laboratory work in the study and control of occupational hazards and other factors in the work environment which affect employee health.

Bachelor's degree in chemistry, engineering, physics, biological sciences, or public health.

# ASSISTANT MECHANICAL ENGINEER

State of California

Prepares designs, detailed drawings, and specifications for mechanical systems such as heating, ventilating, air-conditioning, refrigeration, plumbing, water, sanitary, and drainage systems; checks working drawings; makes field inspections and supervises the installation of mechanical equipment; prepares material lists for mechanical layouts; prepares requisitions for the purchase of materials; prepares reports.

Qualification: One year as Junior Mechanical Engineer in the California state service or two years mechanical engineering experience equivalent to the Junior Mechanical Engineers level. Degree in engineering -- master's degree may substitute for one year of experience.

## ASSISTANT TRANSPORTATION ENGINEER

State of California

Responsible for an assignment, or a phase of a study; performs technical engineering work involving studies of capital costs, financial structure, revenue, expenses, and service; assists and conducts field surveys, traffic counts and traffic studies; assists in the preparation of valuations and inventories; assists in the preparation of reports and exhibits; investigates and recommends safety measures to be applied at grade crossings of highways with railroads and street railroads; investigates and reports on highway accidents as related to transportation agencies; makes maps, graphs, and charts; participates in investigations and hearings; and testifies as a witness in proceedings before Public Utilities Commission.

Qualification: One year of experience in the California state service as a junior level engineer, or two years engineering experience with a transportation agency or public utility or a master's degree in engineering.

Responsible for assignments, or phases of a study, involving technical engineering work in connection with rate tariffs, service and construction standards and tests, application of rules and regulations, elements of the cost of service, inventories, valuations, rate base calculations, rate and earnings investigations, analyses and estimates of future requirements. Participates in investigations and hearings; testifies as a witness in proceedings before the Public Utilities Commission and does other work as required.

Qualification: Two years of engineering experience in one or a combination of the following:

- (1) With a gas, electric, communications, or water utility; or
- (2) With an allied industry involving familiarity with the operation of one of these utilities; or (3) With a regulatory agency. (A master's degree in engineering may be substituted for the required experience.) Bachelor's degree in engineering or additional experience may be substituted.

## ASSOCIATE CHEMICAL ENGINEER

State of California

Assists in planning, organizing, and conducting studies, investigations, and analyses of processes for the conversion of sea and brackish water; performs feasibility studies regarding application of potential conversion processes; makes studies designed to evaluate methods of reclaiming saline water for municipal, industrial or other beneficial use; makes periodic onsite investigations of conversion facilities to study latest developments; reviews, evaluates, and recommends on conversion proposals submitted to the department for consideration; prepares departmental reports and correspondence.

Qualification: Three years of chemical process engineering after college, at least one year of which shall have been related to the field of water treatment or fluid processing. Degree in chemical or mechanical engineering. Graduate work in chemical engineering may substitute for one year of experience.

ASSOCIATE ELECTRONICS ENGINEER

State of California

Conducts research on methods of application of electronic instruments to construction materials research; makes engineering studies of current methods of materials testing including operational requirements and procedures, service demands, equipment needs, and cost analysis; modifies or adapts electronics instruments for the generation, amplification, reception, measurement, or analysis of the transmitted energy in investigating the transmission of sound waves; designs, develops, and tests new electronics equipment; plans, conducts, and reports on experiments, etc.

Qualification: Three years professional electrical or electronics engineering experience at least two years of which shall have been in design, development, and testing of electronics equipment. Degree in electronic or electrical engineering or physics.

ASSOCIATE MOTOR VEHICLE POLLUTION CONTROL ENGINEER    State of California

Performs difficult engineering work in relation to the motor vehicle pollution device testing and certification programs; assists in the development and modification of testing criteria and provides interpretations of established standards and criteria; evaluates applications for certification, and appraises attached engineering test data, drawings, plans, and specifications.

Qualification: Three years of increasingly responsible professional mechanical, chemical or automotive engineering experience, one year of which shall have been concerned with either:

1. The control of hydrocarbon emissions from internal combustion sources; or
2. Developmental work on the design or testing of internal combustion engines or appurtenant equipment. (A master's degree in engineering or a closely related field may be substituted for one year of the non-specialized work experience.)

Bachelor's degree in mechanical or chemical engineering or a closely related field. (Additional qualifying experience may be substituted for the required education on a year-for-year basis.)



BUILDING ENGINEERING INSPECTOR

County of Los Angeles

Inspects privately constructed minor buildings to insure compliance with County building, plumbing, and electrical codes. Reviews plans for building construction details and normal plumbing and electrical installations prior to inspection.

Qualification: Completion of two years in an accredited college with specialization in engineering, architecture, mathematics, or a physical science, or one year's experience as a contractor, foreman, or superintendent in structural, electrical, or plumbing work in the building construction field, or in building inspection, or plan checking. Must have California Class "3" driver's license.

This series includes professional engineering positions concerned with the development or adaptation of materials, methods, and processes used in the manufacture of ceramic products; and with the design, construction, and operation of industrial processes and equipment used in their production. Ceramic products may be considered as those composed of nonmetallic, inorganic minerals which are subjected to high temperature during manufacture or use; and include crystalline materials with desired physical properties, cementitious materials, abrasives, refractories, porcelain enamels, structural clay products, whiteware, and glass products.

Qualification: Bachelor's degree in ceramic engineering.

CHEMICAL ENGINEERING SERIES    GS-5 Entry Level    U.S. Government

This series includes classes of positions engaged in professional work in chemical engineering including research, development, design, operation, production, evaluation, and improvement of processes, plants, equipment, methods, or products which involve (1) changes in the chemical composition or physical state of materials caused by chemical reactions, the actions of living organisms, or applications of energy, and (2) fundamental engineering concepts such as cost considerations, engineering compromises, and considerations of maintenance and use.

Qualification: Bachelor's degree in chemical or related engineering.

This series includes all positions involving work that requires full professional education and training in the field of chemistry. This work includes the investigation, analysis, and interpretation of the composition, molecular structure, and properties of substances, the transformations which they undergo, and the amounts of matter and energy included in these transformations.

Qualification: Bachelor's degree which included 30 semester hours of study of chemistry, which must have included quantitative analysis, inorganic, organic, and physical chemistry. In addition, at least 6 semester hours of physics, and mathematics through differential and integral calculus.

## CRIMINALIST I

County of Los Angeles

In a training capacity, performs physical and chemical analysis required in scientific crime detection. Performs or assists in the performance of physical and chemical analysis of blood, urine, narcotics, drugs, body fluids, paint, glass, hairs, and fibers and other physical evidence; utilizes and learns microscopic comparison, comparison macrophotography, spectroscopy, gas chromatography, and other chemical and physical analysis and comparison techniques. Prepares written findings for court presentation and may testify concerning findings as established by laboratory analysis.

Qualification: Bachelor's degree in technical criminalistics, chemistry, bio-chemistry, or closely related scientific field involving strong laboratory training in chemical analysis.

DATA COMMUNICATIONS ENGINEER

County of Los Angeles

Analyzes, designs, and implements the installation of data communications and associated control systems for County data processing centers. Analyzes existing County computer communications and associated control systems, and makes written recommendations for the maximum utilization of data transmission and control equipment and total system costs. May provide technical direction to engineering and technical personnel assigned to assist in the performance of related tasks.

Qualification: Bachelor's degree in electrical engineering and three years experience in data communications systems engineering in connection with computer installations. Must have California Class "3" driver's license.

Receives training and performs inspections and investigations relative to the enforcement of the State's fire safety laws, rules, and regulations; assists in original fire safety surveys and conducts inspections of any cleaning, spotting, sponging, and pressing establishments and places of assemblage, schools, and institutional occupancies; conducts ventilation and static electricity tests in hazardous areas for compliance with the standards of the State Fire Marshal; conducts fire investigations; prepares comprehensive reports and writes correspondence.

Qualification: Degree in engineering or the physical sciences.

ELECTRICAL ENGINEERING ASSISTANT

County of Los Angeles

Performs detailed electrical engineering design on small projects and performs drafting work on designs prepared by others. Performs detailing and drafting of electrical plans for projects such as power and lighting installations, telemetering, or control systems, or underground and overhead high voltage distribution systems. Makes computations involved in drafting and minor design. Compiles data for plans, specifications, and cost estimates.

Qualification: Bachelor's degree in electrical engineering. Must have California Class "3" driver's license.



ELECTRICAL ENGINEERING SERIES GS-5 Entry Level U. S. Government

This series includes all classes of positions the duties of which are to advise on, administer, supervise, or perform professional work in electrical engineering, which includes (1) basic and applied research, development, planning, design, construction, production, inspection, test, operation, maintenance, standardization, and application of electrical equipment, apparatus, materials, plants, and systems involved in the generation, transmission, conversion, distribution, control, measurement, or utilization of electrical energy for purposes of motive power, heating, illumination, chemical processes, or the production of localized electric or magnetic fields; and (2) work relating to the licensing of hydroelectric projects and regulation of the electric utility industry. This series does not include classes of positions which are concerned principally with electronics or electrical communication matters which require application of the concepts, principles, data, techniques, criteria, and practices characteristic of electronic engineering.

Qualification: Bachelor's degree in industrial engineering.

Designs, plans, and coordinates the installation of electronic communications systems such as radio, microwave, and related electronic equipment. Conducts engineering studies to integrate existing communications systems and to provide optimum utility of the systems, improve system coverage, and to standardize equipment. Provides technical direction to lower level electronic engineering or technical personnel when engaged in a major study or when the design responsibility involves the specific electronic discipline for which the worker is responsible.

Qualification: Bachelor's degree in electrical engineering and four years of engineering experience in the planning and design of electronic communication systems. Must have California Class "3" driver's license.

## ENGINEERING PROGRAMMER-ANALYST

County of Los Angeles

Performs system analyses of engineering computation problems and engineering management information needs, and programs the systems for the computer. Evaluates user-division requests for data processing service involving study, conversion, or modification of existing and new systems or programs to define what the division wants, and how to meet its needs through data processing. Evaluates engineering data processing systems developed by other agencies, recommending for or against adoption based on engineering, data processing, and cost effectiveness; becomes the subject matter expert for the system if it is adopted by his department.

Qualification: Three years' progressively responsible, professional, and varied engineering experience, and one year's experience in the systems analysis and programming of engineering data for electronic data processing.

Performs professional work in the enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act including the performance of inspections and investigations to discover potential and existing violations of laws relating to the composition, adulteration, and misbranding of insecticides, fungicides, rodenticides, herbicides, germicides, nematocides, plant regulators, defoliants, dessicants, and devices; and to gather evidence of violations for presentation in court. Observes and reports on accuracy of labeling of products as to composition, toxicity, and adequate and proper use as required under the Act.

Qualification: Bachelor's degree, including at least 20 semester hours in any one or a combination of chemistry, entomology, plant pathology, plant physiology, nematology, pharmacy, pharmacology, bacteriology and closely related scientific subjects having substantially the same subject-matter content as outlined above. May substitute four years of technical experience.

Learns the techniques and methods used in making inspections and investigations of establishments manufacturing, producing, packing, labeling, or distributing food, alcoholic beverages, drugs, cosmetics, and hazardous substances; receives training and indoctrination in the basic laws and regulations enforced, their application to various types of food, drug, and cosmetic products, and the nature of the violations which may be encountered. Prepares reports and records of inspections and investigations.

Qualification: Bachelor's degree with at least 30 hours of courses in bacteriology, biology, chemistry, etc.

This series includes professional scientific positions that have as their objective the study of the interrelationship and reaction between water and its environment in the hydrologic cycle. These positions have the functions of investigation, analysis, and interpretation of the phenomena of occurrence, circulation, distribution, and quality of water in the earth's atmosphere, on the earth's surface, and in the soil and rock strata. Such work requires application of basic principles of mathematics, physics and chemistry, and specific hydrologic theory and principles drawn from and supplemented by fields such as meteorology, geology, soil science, plant physiology, hydraulics, and higher mathematics.

Qualification: Bachelor's degree with a major in physical or natural science or engineering and must have included 30 semester hours in any combination of the following courses: hydrology, physical science (including geophysical sciences), engineering science, soils, mathematics, aquatic biology, or the management or conservation of water resources. Must have differential and integral calculus and physics.

INDUSTRIAL ENGINEERING SERIES    GS-5 Entry Level    U.S. Government

This series includes all classes of positions that involve professional work in industrial engineering. Industrial engineering is that branch of engineering concerned with planning, design, improvement, analysis, and installation of integrated systems of men, materials, and equipment. The work requires application of specialized professional knowledge and skill in the mathematical, physical, and social sciences together with the principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems.

Qualification: Bachelor's degree in industrial engineering.

# INDUSTRIAL HYGIENE CHEMIST

County of Los Angeles

Conducts analytical and investigative chemical and physical tests to evaluate toxic chemical present as health hazards to employees in industrial plants; serves as consultant to the Health Department staff on problems relating to the chemistry phases of environmental health.

Qualification: Bachelor's degree in chemistry or bio-chemistry, and either (1) a master's degree in chemistry or bio-chemistry, or a related field of environmental chemistry and two years' experience as a professional chemist doing increasingly complex analytical procedures, or (2) four years' experience as a professional chemist doing increasingly complex analytical procedures. Must have Class "3" driver's license.



This specialty includes the study and control of occupational disease and other environmental factors affecting employee health. The factors include physical and chemical hazards such as ionizing radiation, microwave radiation, noise, heat, pressure, and toxic materials. The industrial hygienist works and collaborates closely with physicians, engineering departments, shop supervisors, and management with the objective of protecting personnel from industrial health hazards. The industrial hygienist applies his special knowledge to the identification and quantification of health hazards associated with various operations. He then develops practical methods to control or eliminate the potential hazard. He may perform research and development of industrial hygiene instruments, methods, and techniques.

Qualification: Bachelor's degree in engineering, a physical science, or a natural science. Must include at least 15 semester hours in chemistry, and courses in qualitative and quantitative analysis. May substitute four years of technical experience.

## INDUSTRIAL WASTE CHEMIST

County of Los Angeles

Conducts tests of saline and potable waters and industrial waste in order to prevent pollution of underground water tables, local rivers, and water wells and to maintain suitable chemical conditions in the liquid waste disposal system.

Qualification: Graduation from an accredited college with specialization in chemistry or chemical engineering, and two years' experience making chemical analyses of water, sewage, or industrial wastes. An advanced degree in chemistry from an accredited college may be substituted for one year of the required experience.

JUNIOR CHEMICAL TESTING ENGINEER

State of California

Makes routine chemical analyses of raw materials and finished products, such as ferrous and nonferrous metals, protective coatings, traffic line paints and other paints, fuel and weed oils, asphaltic materials, cement, and concrete aggregates, soils, foundation materials, water, water for concrete and other engineering or miscellaneous materials; prepares and standardizes solutions used in analytical work.

Qualification: Graduate from college with major in chemistry or chemical engineering.

Note: May also qualify on the basis of two years experience in chemistry or chemical engineering and completion of 12th grade.

## JUNIOR CHEMIST

State of California

Junior Chemists make physical and chemical analyses to determine the identity and concentration of substances that may be constituents, adulterants, contaminants, or potentially hazardous chemicals; collects field samples; and assists in the development and testing of new laboratory and field apparatus.

Junior Chemists are employed by the Department of Agriculture, Fish and Game, and Public Health.

Qualification: Bachelor's degree in chemistry.

JUNIOR MECHANICAL ENGINEER

State of California

Assists in the preparation of plans and specifications for mechanical systems in dams, electrical power plants, substations, highway bridges, and institutional and office buildings; prepares material lists and purchase requisitions; inspects the installation of mechanical materials and equipment; and prepares reports.

Qualification: Bachelor's degree in mechanical engineering.

JUNIOR PLANNING ASSISTANT

County of Los Angeles

Performs planning analysis and design work under technical supervision and collects data for and assists in the preparation of planning studies and reports. Makes field studies and assists in the collection, tabulation, and interpretation of land use data. Compiles data on planning problems and writes reports for cases studied based on the data compiled. Prepares legal notices and property descriptions and checks advertising copy of notices of hearing and legal advertisements to insure proper descriptions from official engineering drawings and legal bases.

Qualification: Bachelor's degree with 15 units of upper division courses in one or any combination of the following: planning, civil engineering, architecture, landscape architecture, business administration, public administration, geography, sociology, or economics.

This series includes all positions the duties of which are to advise on, administer, supervise, or perform work which requires professional education and training in the field of mathematics. This work includes research on basic mathematical principles, methods, procedures, techniques, or relationships; the development of mathematical methods in the solution of a variety of scientific, engineering, economic, and military problems, where the exactitude of the relationships, the rigor and economy of mathematical operations, and the logical necessity of the results are the controlling considerations.

Qualification: Bachelor's degree with 24 semester hours in mathematics including differential and integral calculus, plus four advanced mathematics courses which require calculus or equivalent mathematics courses as a prerequisite.

MECHANICAL ENGINEERING ASSISTANT

County of Los Angeles

Designs parts or details of mechanical systems, such as heating, cooling, piping, or hydraulic controls under close supervision, and does the design drafting involved in preparing plans of the designs of higher level engineers. Performs detailing and prepares portions of working drawings for low and high pressure steam plants, steam distribution and water works systems, sprinkler systems, and general piping design sketches following verbal guidelines supplied by higher classified personnel.

Qualification: Bachelor's degree in mechanical engineering.



MECHANICAL ENGINEERING SERIES GS-5 Entry Level U. S. Government

This series includes professional positions in the field of mechanical engineering, typically requiring the application of thermodynamics, mechanics, and other physical, mathematical, and engineering sciences to problems concerned with the production, transmission, measurement, and use of energy, especially heat and mechanical power.

Qualification: Bachelor's degree in mechanical engineering.

## MEDICAL ELECTRONICS TECHNICIAN

County of Los Angeles

Installs, maintains, and repairs a variety of electronic equipment including that adapted for medical purposes, including television receivers, entertainment radio receivers, record players, movie projectors, audio amplifiers, intercommunications systems, and related audio equipment.

Installs, maintains, and repairs electrocardiographs, electroencephalograph, motion picture cameras, pacemakers, electric knives, electronic laboratory equipment, and other electronic equipment used for medical purposes.

Qualification: Three years' experience in the installation, maintenance and repair of two or more of the following types of electronic equipment: television, radio, recording, public address, intercommunications, or medical equipment.

This series includes positions that require primarily professional education and training in the field of metallurgy, including ability to apply the relevant principles of chemistry, physics, mathematics, and engineering to the study of metals. Metallurgy is the art and science of extracting metals from their ore, refining them, alloying and preparing them for use, and studying their properties and behavior as affected by composition, treatment in manufacture, and conditions of use.

Qualification: Bachelor's degree with at least 20 semester hours in metallurgical subjects acceptable for credit toward a bachelor's or higher degree in metallurgy or metallurgical engineering.

## METEOROLOGIST

County of Los Angeles

Collects and analyzes meteorological data, makes forecasts, prepares weather charts, and makes investigations relating meteorological data to the problem of air pollution control. Makes detailed forecasts of expected weather and air pollution conditions for periods of up to 48 hours duration and more general forecasts for longer periods. Prepares streamline charts from charts of plotted wind direction and speed, isobaric analyses of pressure and wind systems, frontal analyses and other weather charts and maps as directed.

Qualification: Bachelor's degree in meteorology and two years' experience in the fields of meteorological research or forecasting, one year of which must have included research in or the forecasting of local low-level meteorological conditions such as surface wind flow and air stability. Acceptable substitution: Completion of one year of graduate work in meteorology in an accredited college for the one year of non-specialized experience.

METEOROLOGIST I

State of California

Assists in the performance of a variety of meteorological studies and in the analysis, evaluation, and adoption, to meet agency needs, of meteorological studies performed by other agencies; assists in the analysis of historical meteorological conditions existent during storms of record, in the preparation of quantitative precipitation forecasts, and the evaluation of the effect of storms on projects under construction; etc.

Qualification: Two years experience in professional meteorological work including surface and upper air analyses. (Masters in meteorology or hydrology may be substituted for one year of the required experience.) Bachelor's degree in mathematics or physical science.

This series includes all classes of positions the duties of which are to advise on, administer, supervise, or perform research or other professional and scientific work in meteorology, including the investigation of phenomena and conditions of the atmosphere; the analysis of meteorological data to predict weather and hydrologic elements, or to determine the climate of specific geographic areas; the development of new or better theory to improve understanding of the phenomena and conditions of the atmosphere of itself and in relation to other phenomena and events; and the development of methods, procedures, instruments, and techniques necessary to carry out the above work.

Qualification: Bachelor's degree with 20 semester hours in meteorology (including 6 semester hours in weather analysis and forecasting) and in addition, differential and integral calculus and 6 semester hours in college physics.

NUCLEAR ENGINEERING SERIES    GS-5 Entry Level    U. S. Government

This series includes positions which require application of professional knowledge and competence in nuclear engineering to research, development, design, testing, installation, operation, refueling, and maintenance of equipment and systems which release, control, and utilize nuclear energy. Positions in this series require a broad knowledge of fundamentals of engineering and science together with specialized knowledge of nuclear systems, processes, and effects.

Qualification: Bachelor's degree in nuclear engineering.

This series includes professional scientific positions engaged in the collection, measurement, analysis, evaluation, and interpretation of natural and physical ocean phenomena such as currents, circulation, waves, beach and near-shore processes, chemical structure and processes, physical and submarine features, depth floor configuration, organic and inorganic sediments, sound and light transmission, color manifestations, heat exchange, and similar phenomena and their interrelations with other marine phenomena. Oceanographers plan, organize, conduct, and administer seagoing and landbased study and research of ocean phenomena for the purpose of interpreting, predicting, utilizing, and controlling ocean forces and events.

Qualification: Bachelor's degree with 24 semester hours in oceanography or a related discipline such as physics, meteorology, geophysics, mathematics, chemistry, engineering, geology, or biology, plus 20 semester hours in any combination of oceanography, physics, geophysics, chemistry, mathematics, meteorology, and engineering sciences.

Note: Qualification on the basis of major study in biology or geology must show at least 6 semester hours in the pertinent major directly concerned with marine science, or in oceanography; qualification on the basis of the other physical sciences, or engineering must show differential and integral calculus and at least 6 semester hours in physics.



OPERATIONS RESEARCH SERIES    GS-5 Entry Level    U. S. Government

This series includes positions which involve professional and scientific work requiring the design, development, and adaption of mathematical, statistical, econometric, and other scientific methods and techniques to analyze problems of management and to provide advice and insight about the probable effects of alternative solutions to these problems. The primary requirement of the work is competence in the rigorous methods of scientific inquiry and analysis rather than in the subject matter of the problem.

Qualification: Bachelor's degree with at least 24 semester hours of coursework in any combination of the following: operations research; mathematics; statistics; logic; and subject-matter courses which require substantial competence in mathematics or statistics.

## PHYSICIST

This series includes all classes of positions the duties of which are to advise on, administer, supervise, or perform research or other professional and scientific work in the investigation and applications of the relations between space, time, matter, and energy in the areas of mechanics, sound, optics, heat, electricity, magnetism, radiation, or atomic and nuclear phenomena.

Qualification: Bachelor's degree with 24 semester hours which include a fundamental course in general physics and courses in any two of the following: (a) electricity and magnetism; (b) heat; (c) light; (d) mechanics; (e) modern physics; (f) sound. The courses must be acceptable for credit toward the bachelor's degree with a major in physics.

PRINCIPAL ELECTRONICS ENGINEERING ASSISTANT

County of Los Angeles

Designs, plans and coordinates the installation of electronic communications systems including public address, electronic intercommunications, closed circuit television, radio, microwave, and related electronic equipment and assists in the design of complex electronic communications systems. Makes engineering studies to determine the need and practicability of establishing additional communications and control systems for County departments and recommends type of system for such needs.

Qualification: Bachelor's degree in electrical engineering and three years' engineering experience in the planning and design of electronic communications systems. Must have California Class "3" driver's license.

PROGRAM SUPERVISOR, QUANTITY CONTROL

State of California

Bureau of Weights  
and Measures

Plans, formulates, organizes, and directs quantity control programs; develops standards and testing procedures for analysis of equipment and process variables; develops new statistical quality control methods and statistical techniques or adapts existing methods and techniques to the formulation of quantity control programs; conducts research and makes recommendations in quantity control methods; supervises and trains a staff engaged in enforcing provisions of the Business and Professions Code and rules and regulations relating to the weights, measures, and numerical count of commodities in packages or containers; assists in the development and prosecution of court cases arising in connection with the work of the Bureau and county scalers of weights and measures; conducts investigations and holds hearings.

Qualification: Four years of increasingly responsible experience in manufacturing, production, or process engineering, or quality control, including or supplemented by at least two years experience in development or direction of a comprehensive program of statistical quality control.

(A master's degree in industrial engineering, mathematics, business administration or a related field may substitute for one year of the required experience. Bachelor's degree with a major in engineering or a closely related field. (Additional qualifying experience may substitute for the required education on a year-for-year basis.)

## RADIOLOGY EQUIPMENT SPECIALIST

County of Los Angeles

Plans the procurement and installation of radiological and related equipment for a very large hospital radiology service, and coordinates repair and maintenance services for such equipment. Prepares performance specifications for use in purchasing new radiological equipment and related photographic equipment such as film processors, or for modifications of existing equipment which must be adapted to meet specific needs; analyzes and evaluates bids received from vendors and prepares written recommendations.

Qualification: Bachelor's degree in electrical engineering or physics and three years' experience in the procurement, sales engineering, installation, or repair of radiological and related electronics equipment.

SAFETY ENGINEER (INDUSTRIAL)

State of California

Division of Industrial  
Safety

Visits various manufacturing plants, mills, foundries, stamping plants, bakeries, refineries, laundries, shipbuilding plants, printing plants, canneries, machine shops, glass factories, and similar places of employment, and inspects the equipment and operations for compliance with the Safety Orders of the Division of Industrial Safety and for unsafe conditions or unsafe practices not covered in the Safety Orders; gives instruction and advice to employers and employees on accident prevention, the elimination of injurious working conditions, the placing of guards, and on other accident prevention problems. Meets with management, labor, and public groups interested in promoting safety and safety programs; prepares safety articles for publication and gives talks before interested groups.

Qualification: Two years of safety engineering experience in industrial plants or three years of engineering experience in industrial plants and education equivalent to graduation from college with specialization in engineering. (Additional qualifying experience may be substituted for the required education on a year-for-year basis.)

This series includes classes of positions which involve professional safety engineering work to control physical conditions and operating practices with the objective of eliminating the factors which are known or predicted to result in injury to persons or damage to property.

Qualification: Bachelor's degree in safety engineering.

SAMPLING STANDARDS ANALYST

State of California

Department of Agriculture

Plans, surveys, studies, and analyzes testing procedures and commodity sampling standards to be used in the Department of Agriculture's inspection programs; to determine reliability, confidence limits, and acceptable quality and quantity levels of agricultural commodities for compliance purposes; evaluates existing sampling plans and testing procedures; develops, recommends, and implements new statistical sampling standards, plans, and procedures to provide appropriate commodity random sampling standards; conducts studies of agricultural processing methods, plant operations, and machine capabilities; prepares charts, diagrams, and other statistical data to determine agricultural industry quality averages, tolerances, and control limits; prepares reports and correspondence.

Qualification: Two years of responsible technical experience in manufacturing, production, process engineering, or quality control, at least one year of which shall have included the development or implementation of a comprehensive statistical quality control program. (A master's degree in industrial engineering, mathematics, business administration, or a related field may be substituted for one year of the required experience.) and education equivalent to graduation from college. (Additional qualifying experience may be substituted for a maximum of four years of the required education on a year-for-year basis.)



Sanitarians plan and administer programs designed to identify, prevent, and eliminate environmental health hazards. These programs include milk and food, water supply, waste, insect and rodent, and other areas. They develop standards and other guidelines for sanitation, and enforce regulations for food processing and serving, collection and disposal of waste, sewage treatment and disposal, plumbing, vector control, recreational areas, sanitation in hospitals, and other health facilities. They evaluate the operation of facilities, projects, and programs and advise officials on the use of methods and techniques in resolving environmental health problems. They advise and assist community leaders, agency representatives, and others in improving and obtaining water supply extension, improved sewage disposal, safer recreational areas, more hygienic conditions in nursing and convalescent homes, etc.

Qualification: Bachelor's degree which included or was supplemented by, at least 30 semester hours in a science or any combination of sciences directly related to environmental health (such as sanitary science, public health, chemistry, microbiology, or any appropriate agricultural, biological, or physical science. May substitute four years of appropriate experience.

## SOFTWARE ANALYST

County of Los Angeles

Develops and maintains appropriate operating and specialized software for centralized and remote data centers in the County computer system. Analyzes programming documentation and confers with analysts to learn the objectives of the programs for which the software is needed. Writes software programs using assembly or machine language. Maintains the operating or specialized software of the computer system by modifying or updating existing software.

Qualification: Two years recent experience in software systems analysis, programming and support, one year of which must have included programming in basic assembler language.

## STATISTICAL METHODS ANALYST I

State of California

Job is concerned with the use of statistical data in the investigation and analysis of specific subject fields. Positions in the statistical series of classes are primarily concerned with the development of collection and reporting procedures and the statistical analysis of data.

Qualification: Degree in statistics or other applied science area which included or has been supplemented by a minimum of 12 semester hours of progressively more difficult courses in statistics and 12 semester hours of college level mathematics, including a course in calculus.

Note: It is possible to substitute experience requiring the use of mathematic-statistical theory.

This series includes all classes of positions the duties of which are to administer or perform professional work, or to provide professional consultation in the application of statistical theories, techniques, and methods to the gathering and/or interpretation of quantified information.

Qualification: Bachelor's degree with 15 semester hours in statistics (or mathematics and statistics provided at least 6 semester hours are in statistics) plus 9 additional hours in one of the following: (1) the physical or biological sciences, medicine, education, or engineering; or (2) the social sciences including demography, history, economics, social welfare, geography, international relations, social or cultural anthropology, health sociology, political science, public administration, psychology, etc.

## TOXICOLOGIST

County of Los Angeles

Performs chemical analyses to determine the presence of and quantity of toxic agents in post-mortem specimens submitted for laboratory study. Performs chemical analyses of blood, urine, bile, liver, kidney, and other specimens utilizing standard laboratory techniques such as microscopy, spectrophotometry, chromatography, and gravimetric and volumetric analysis.

Qualification: Bachelor's degree in chemistry or biochemistry, and one year's experience in analytical chemistry, biochemistry, pharmacology, or toxicology. Completion of one year's graduate work in an accredited college with specialization in chemistry or biochemistry will be accepted for the required experience.

WEIGHTS AND MEASURES TECHNICIAN I

State of California

Bureau of Weights  
and Measures

Inspects, tests, and seals or condemns all types of scales, measuring devices, meters and vehicle tanks used as measures; inspects and corrects weighing and measuring standards used by county sealers; investigates complaints concerning improper weights and measures; weighs goods in containers; prepares reports of inspections; works in cooperation with county weights and measures officials.

Qualification: Two years of experience in the operation, inspection, maintenance, repair, or installation of weighing, measuring, or other precision instruments or equipment, or in the enforcement of state weights and measures laws. (College training with major work in chemistry, physics, or engineering, or a related physical science may be substituted for the required experience on a year-for-year basis.)

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